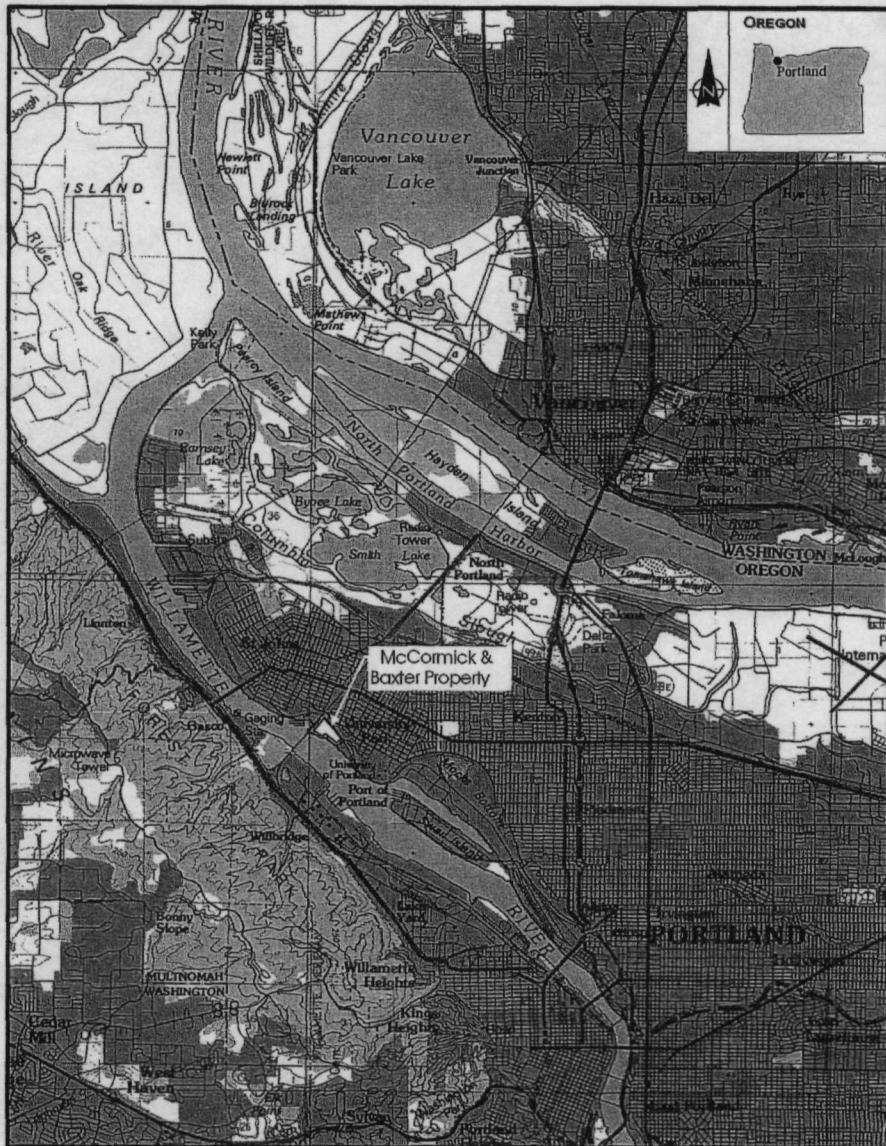


McCormick & Baxter Superfund Site Portland, Oregon Site Overview/Conceptual Model

April 16, 2002 Presentation

McCormick & Baxter Property Location

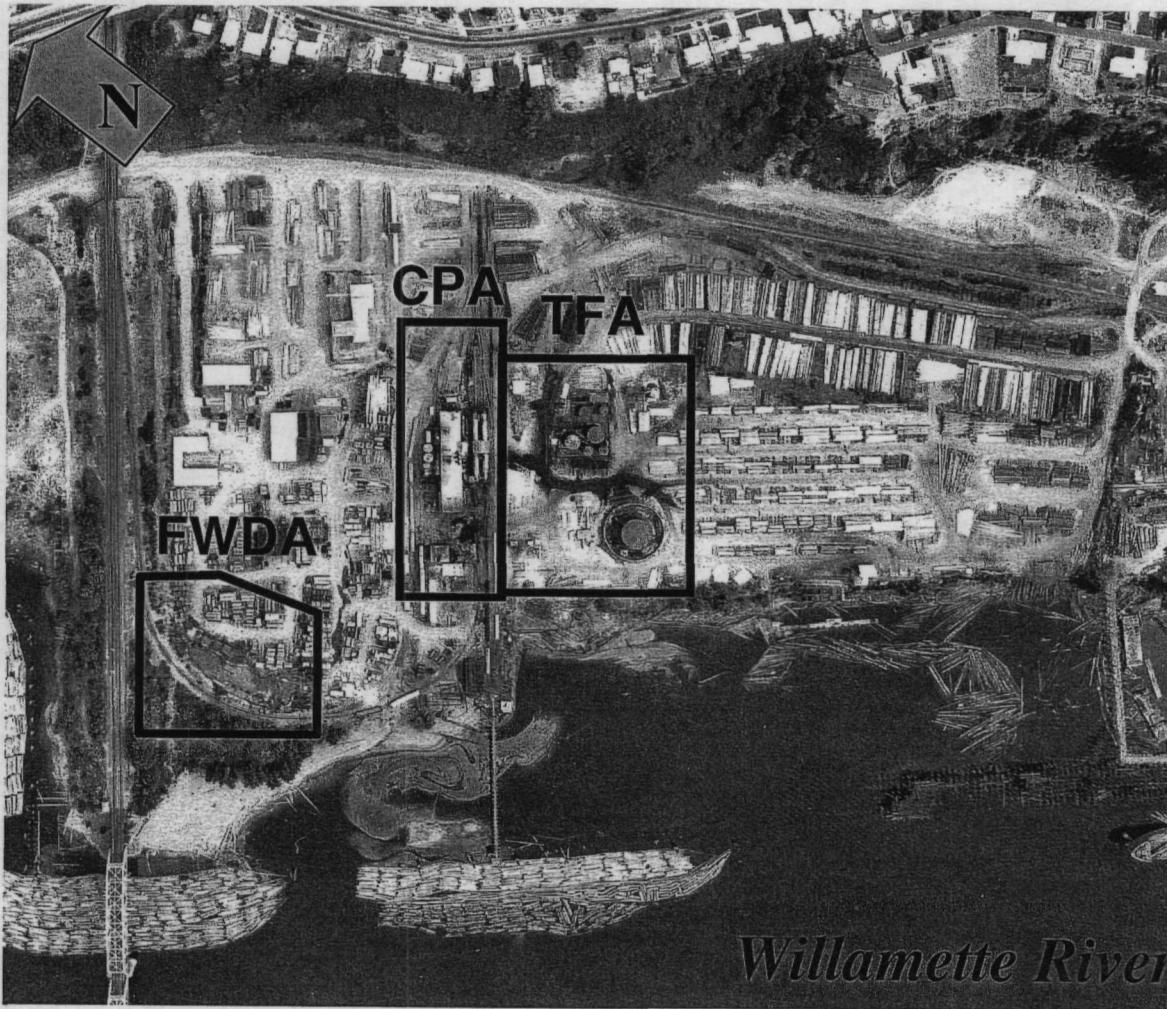




Site Operations History

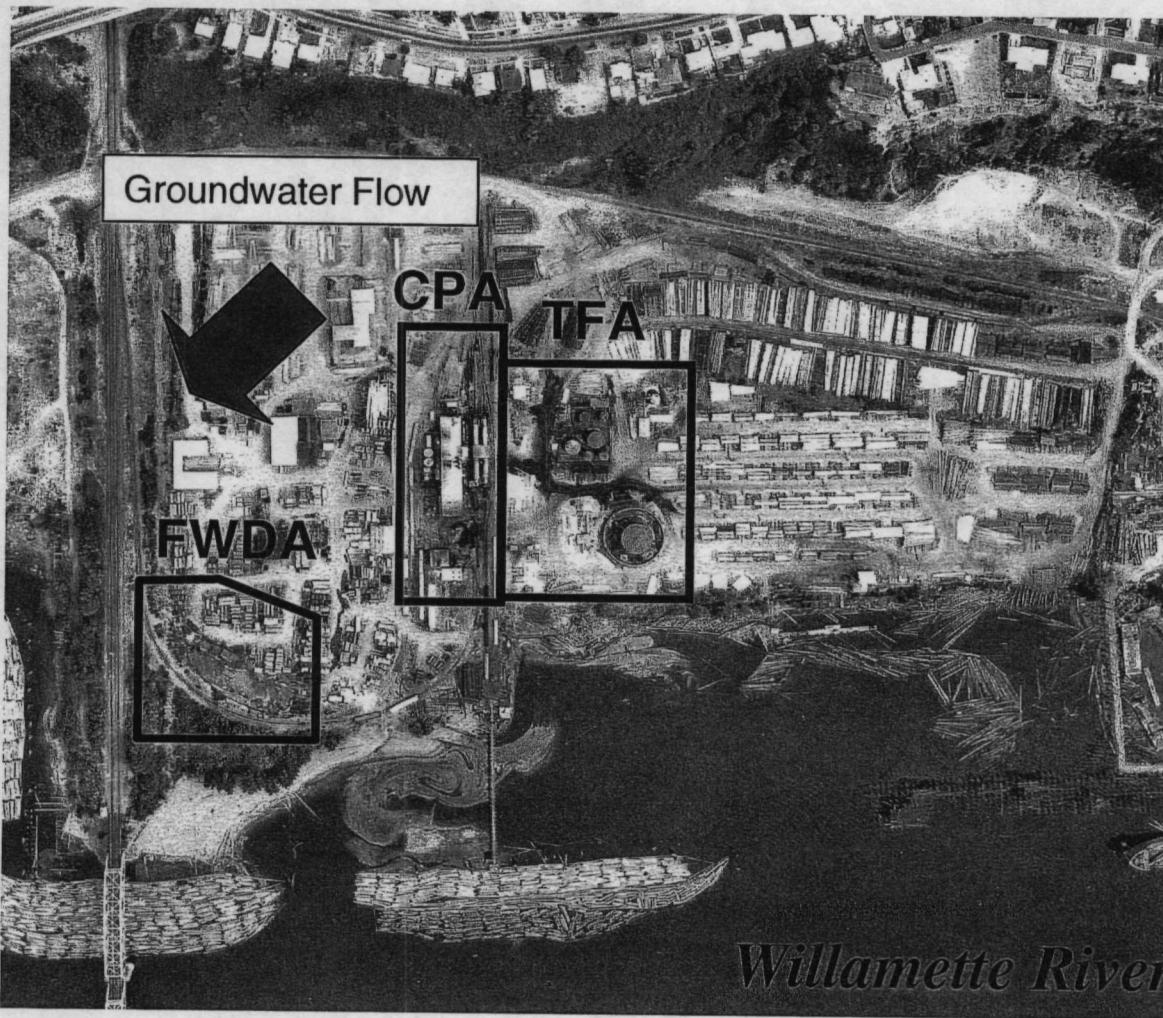
- **1944 to 1991 Wood Treating Operations**
- **1991 Bankruptcy**
- **1994 Superfund Listing**
- **1996 Record of Decision**

Site Operations



Aerial Photo
1973

Primary Release Areas and Groundwater Flow Toward Willamette River



**Aerial Photo
1973**

Liquid Product and Waste Types

Treating Solutions

- PCP in oils (e.g., diesel)
- Creosote
- Metals present in water based aqueous treating solutions (ACZA)

DNAPLs

- Creosote product
- Creosote wastes

LNAPLs

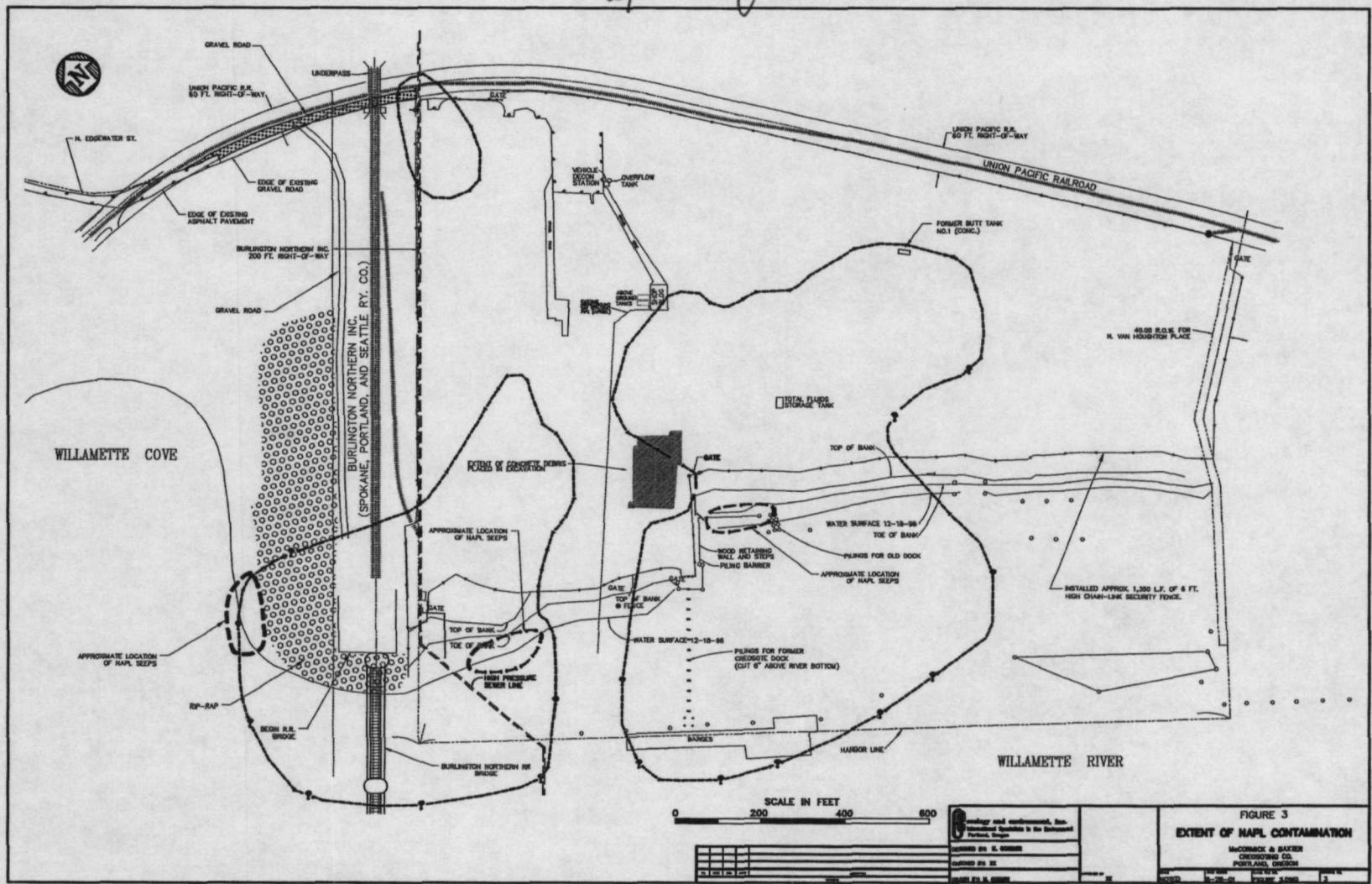
- Diesel-range carriers
- PCP typically in LNAPL plumes

Origin of Source Material

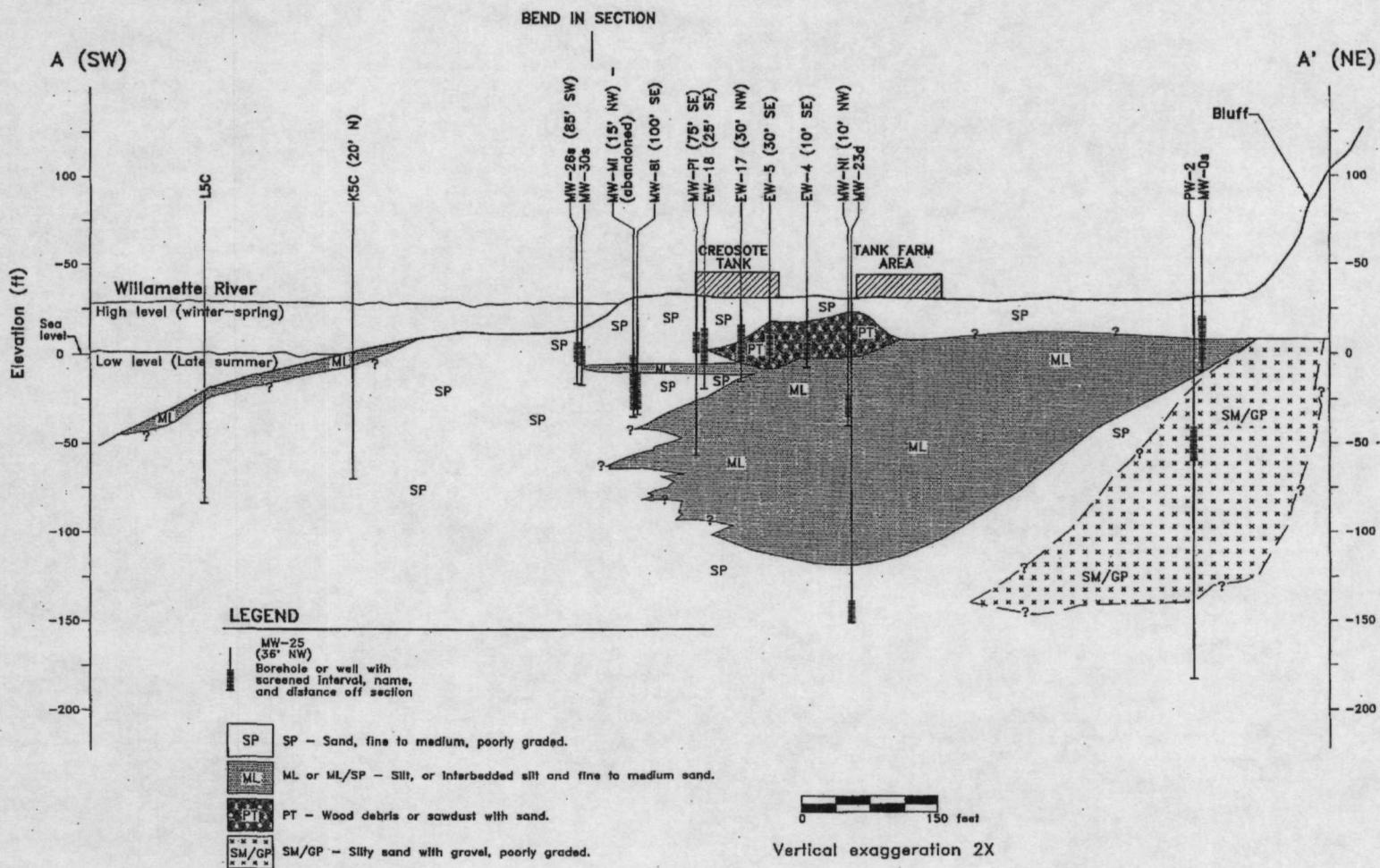
- **TFA - Pure product: creosote and medium aromatic treating oils (e.g., diesel)**
Waste material:process area waste (LNAPL and DNAPL)
- **CPA - Retorts , PCP mixing area, ACZA storage**
- **FWDA - Discharge of waste fluids**
- **Creosote Dock – Pure product spillage**
- **MW-1 – Bunker oil range (viscous LNAPL) related to product line along railroad tracks**
- **Southeast Waste Disposal Area – Overflow of oily wastes from system pits and tank farm.**

NAPL Plume Areas

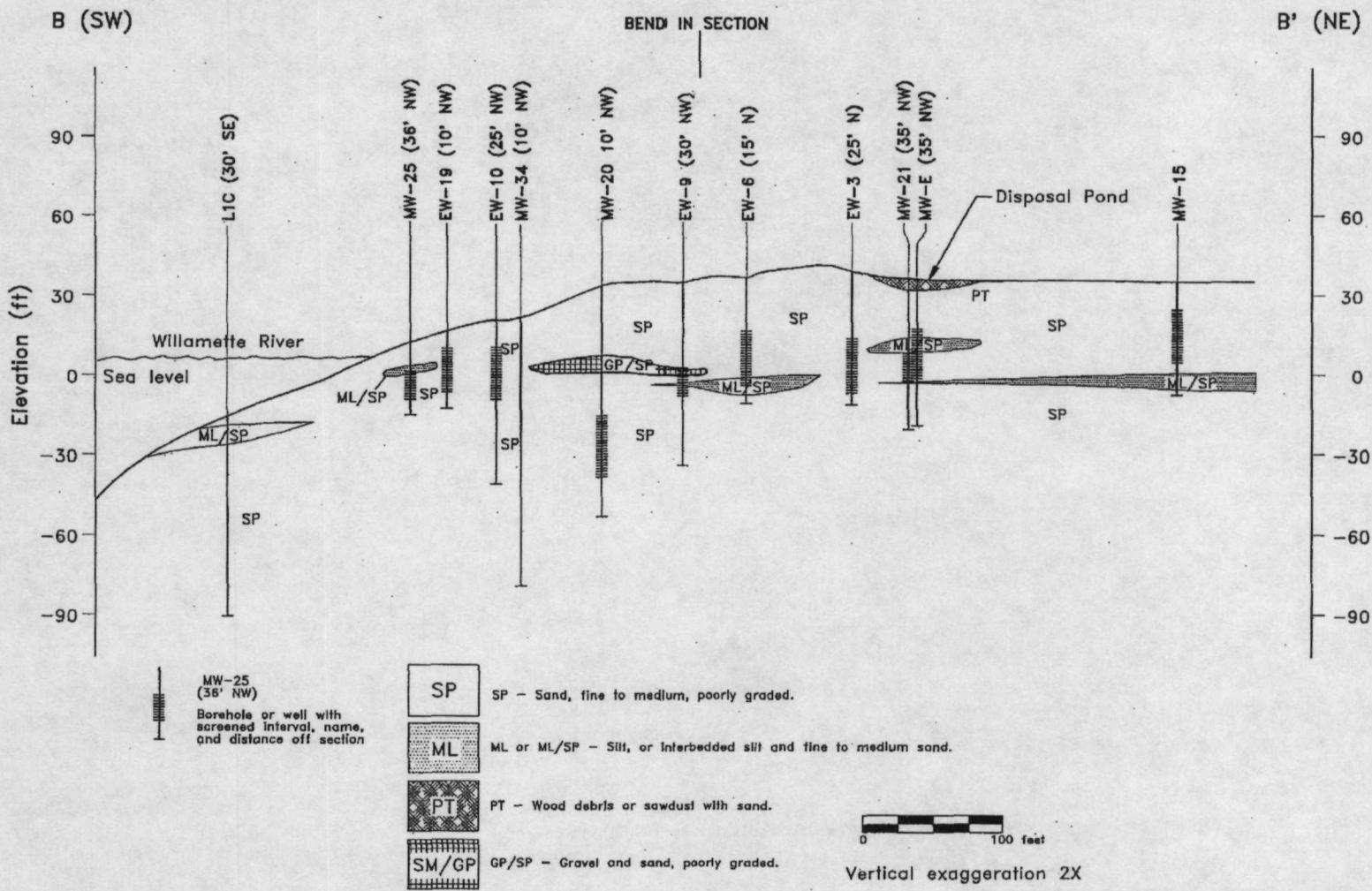
-extent of LNAPL, DNAPL, residual NAPL, soil staining too



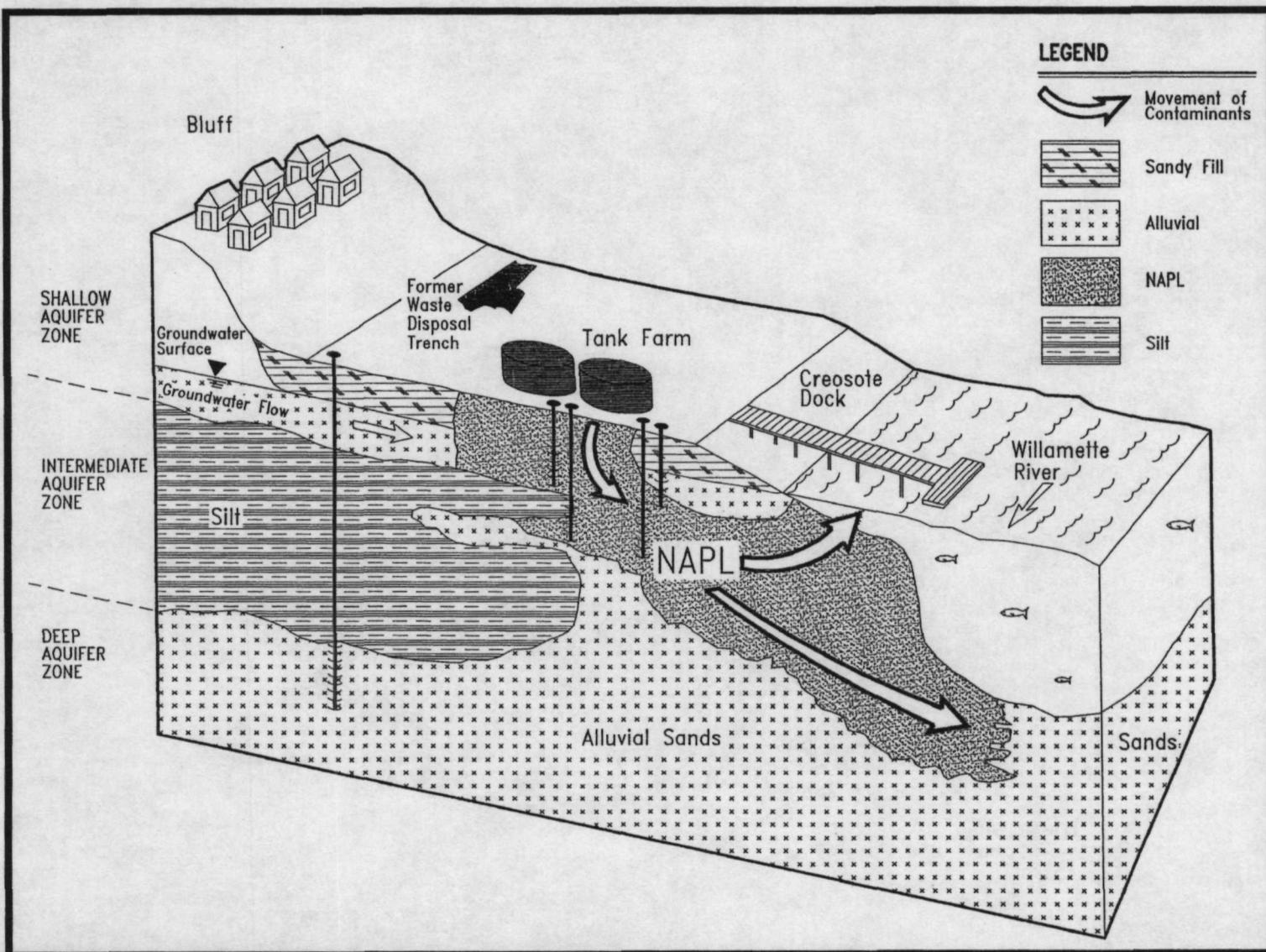
Generalized Geologic Cross-Section A-A'



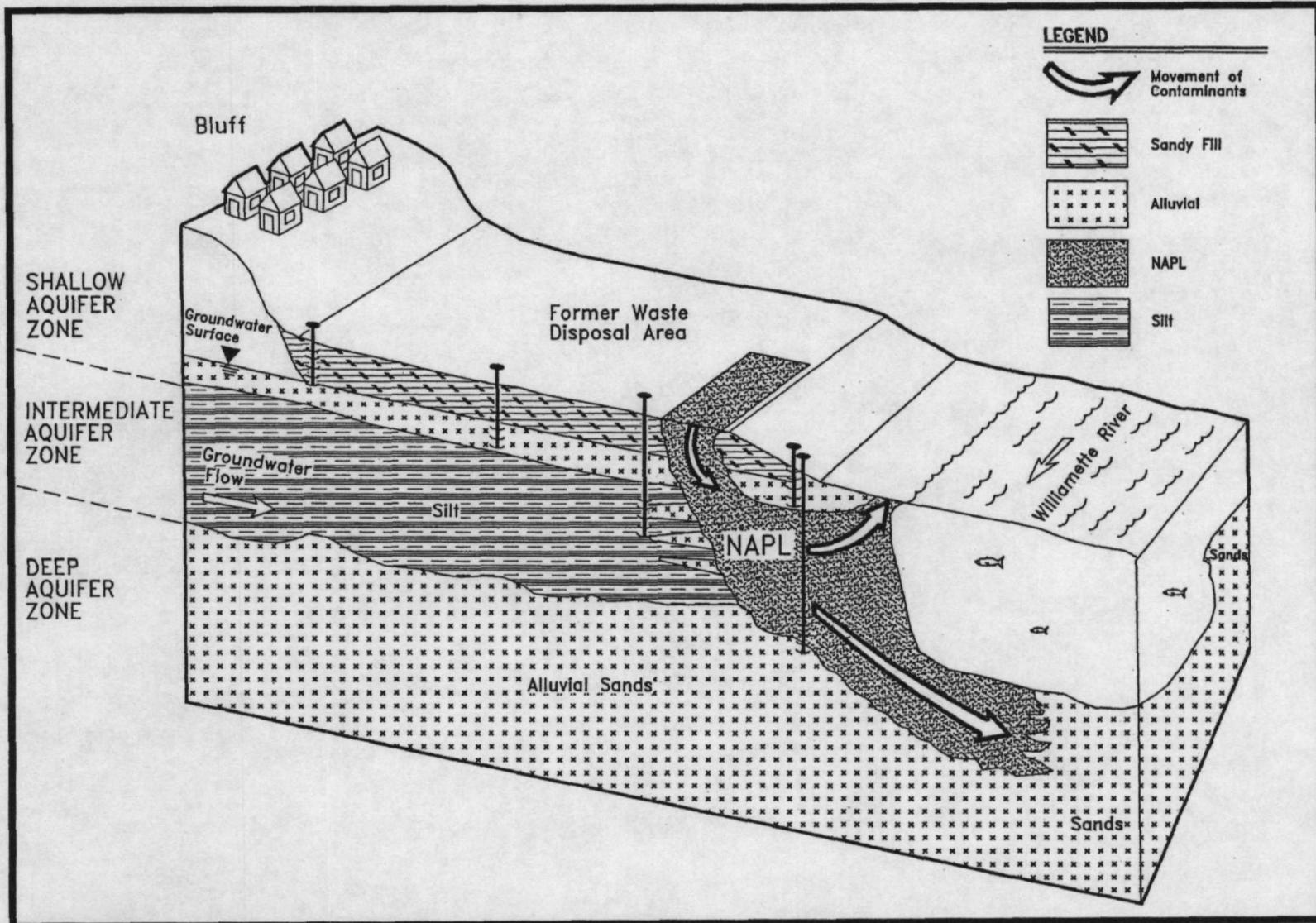
Generalized Geologic Cross-Section B-B'



Conceptual Site Model - Tank Farm Area



Conceptual Site Model - Former Waste Disposal Area



NAPL Source Control Actions

- Pre-ROD Removal Actions – highly contaminated soils
- Interceptor Trench in TFA
- Sediment Wells
- NAPL Extraction Pilot Testing 1988-1995
 - Dual Phase Pumping (water and DNAPL)
 - Passive Pumping (NAPL only)
 - Enhanced Extraction Pumping (induced upwelling)
 - Total Fluids
 - Pulse/Continuous Pumping

Phase I Soil Removal Action

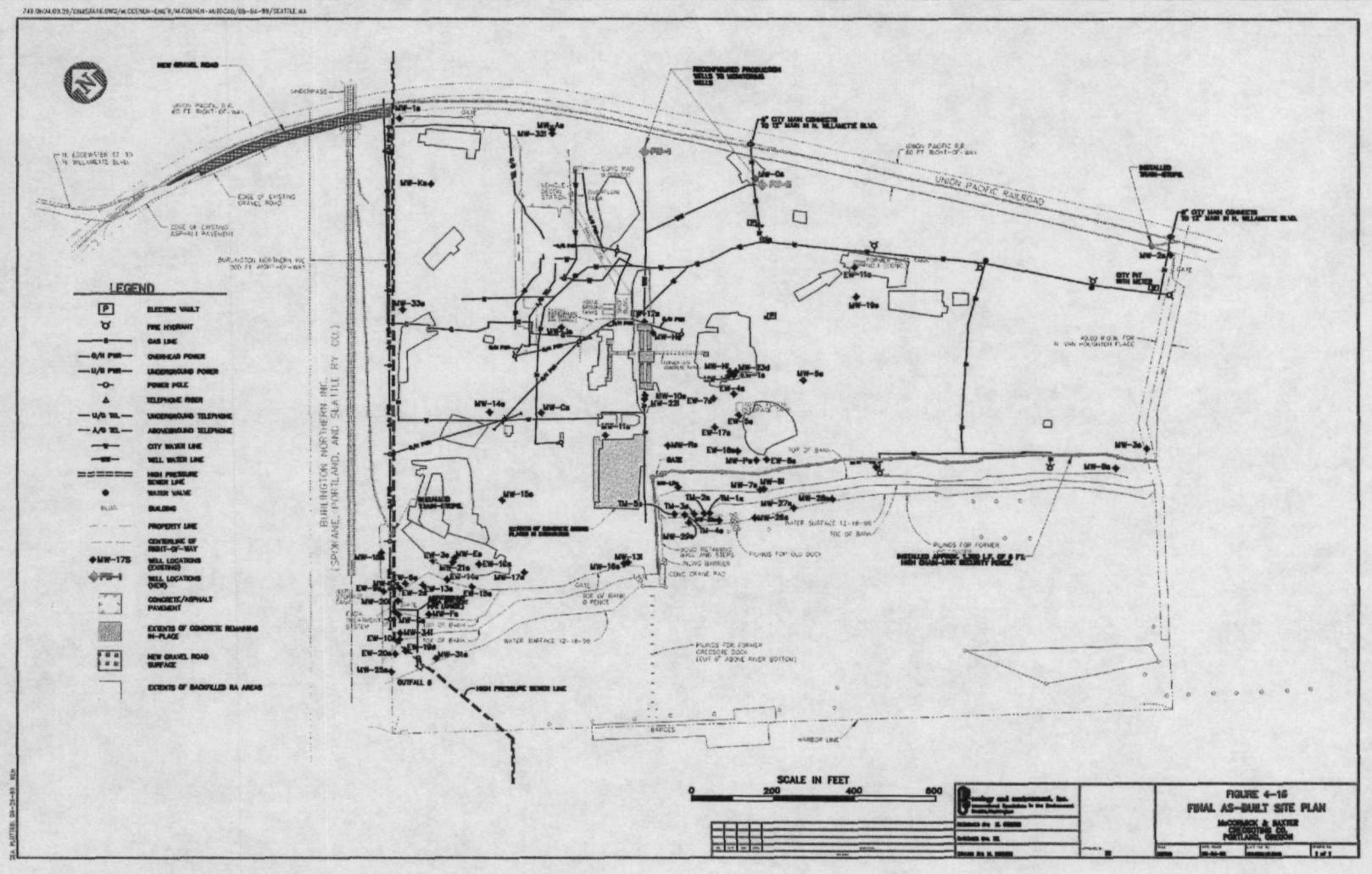
March – April 1999

- Soil and debris excavation and off-site disposal as hazardous waste – 33,771 tons
- Building demolition, creosote dock/log loader structure demolition, utility pole/pilings removal, disposal as nonhazardous waste – 348 tons
- Railroad track and scrap metal salvage – 580 tons

Phase I Soil Removal Action March – April 1999 (Continued)

- Concrete structure demolition and on-site consolidation as backfill – 2,937 cubic yards
- Removal of below-ground process piping – 4,747 feet
- Salvage of railroad ties – 195 tons
- Placement of backfill from off-site source – 33,128 tons

Phase I Removal Areas



NAPL Well Classifications (1997 – 2001) TFA

Well ID	3rd Qu. 1997	4th Qu. 1997	1st Qu. 1998	2nd Qu. 1998	2nd Half 1998	1st Half 1999	2nd Half 1999	1st Half 2000	2nd Half 2000	1st Half 2001	2nd Half 2001
Tank Farm Area											
EW-1s	●	●	●	●	○	●	○	-	⊕	○	○
EW-4s	●	○	○	○	○	○	○	○	⊕	⊕	⊕
EW-5s	●	●	●	●	●	●	-	-	⊕	⊕	⊕
EW-7s	●	○	○	○	●	○	●	○	⊕	⊕	⊕
EW-8s	○	○	○	●	○	●	-	-	○	○	○
EW-12s	●	●	●	●	○	○	-	-	○	○	○
EW-17s	●	○	○	●	●	○	●	○	○	○	○
EW-18s	●	○	○	○	●	○	-	-	○	○	○
EW-24s	-	-	-	-	○	●	●	●	●	○	○
EW-25s	-	-	-	-	○	○	○	○	○	○	○
MW-1s	●	●	●	●	●	●	-	-	-	-	○
MW-LRs	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	--	--
MW-Ps	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	○	--
MW-Rs	○	○	○	○	●	○	●	●	●	○	○
MW-7s	○	○	●	○	○	○	●	●	-	○	○
MW-8i	○	○	○	○	○	○	-	-	○	○	○
MW-10s	●	○	○	●	●	○	●	●	●	○	○
MW-11s	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	--
MW-22i	○	○	○	●	●	●	-	-	○	○	○
TM-1s	-	-	-	-	-	-	●	●	-	○	○
TM-3s	-	-	-	-	-	-	○	○	-	○	○
TM-4s	-	-	-	-	-	-	○	○	-	○	○
TM-5s	-	-	-	-	-	-	●	●	●	○	○

Key:

- = LNAPL thicknesses measured during reporting period.
- = DNAPL thicknesses measured during reporting period.
- = LNAPL and DNAPL thicknesses measured during reporting period.
- ⊕ = No NAPL thicknesses measured during reporting period.
- = Not measured.

NAPL Well Classifications (1997 – 2001) FWDA and Other Areas

Well ID	3rd Qu. 1997	4th Qu. 1997	1st Qu. 1998	2nd Qu. 1998	2nd Half 1998	1st Half 1999	2nd Half 1999	1st Half 2000	2nd Half 2000	1st Half 2001	2nd Half 2001
Former Waste Disposal Area											
EW-2s	●	⊕	⊕	●	●	●	●	●	●	⊕	⊕
EW-3s	●	⊕	●	●	●	●	●	●	⊕	●	●
EW-6s	●	●	●	●	●	●	●	●	●	⊕	●
EW-9s	●	●	●	●	●	●	●	●	●	●	⊕
EW-10s	●	●	●	●	●	●	●	●	●	●	●
EW-13s	●	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
EW-14s	●	●	●	●	●	●	●	●	●	●	●
EW-15s	●	⊕	●	●	●	●	●	●	●	●	●
EW-19s	⊕	⊕	⊕	⊕	⊕	⊕	●	●	●	⊕	⊕
EW-20s	⊕	⊕	●	●	●	●	●	●	●	●	●
EW-22s	●	●	●	●	●	●	●	●	●	●	●
EW-23s	⊕	⊕	⊕	⊕	⊕	⊕	●	●	●	●	●
MW-Ds	●	●	●	●	●	●	●	●	●	●	●
MW-Es	●	●	●	●	●	●	●	●	●	●	●
MW-Gs	●	●	●	●	●	●	●	●	●	●	●
MW-18s	⊕	⊕	●	●	●	●	●	●	●	●	●
MW-20i	●	●	●	●	●	●	●	●	●	●	●
MW-21s	●	●	●	●	●	●	●	●	●	●	●
Other Areas											
EW-11s	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
MW-1s	⊕	⊕	●	●	●	●	●	●	●	●	●
MW-19s	⊕	●	⊕	●	●	●	●	●	●	●	●
MW-35s	-	-	-	-	⊕	⊕	⊕	⊕	⊕	⊕	⊕

Key:

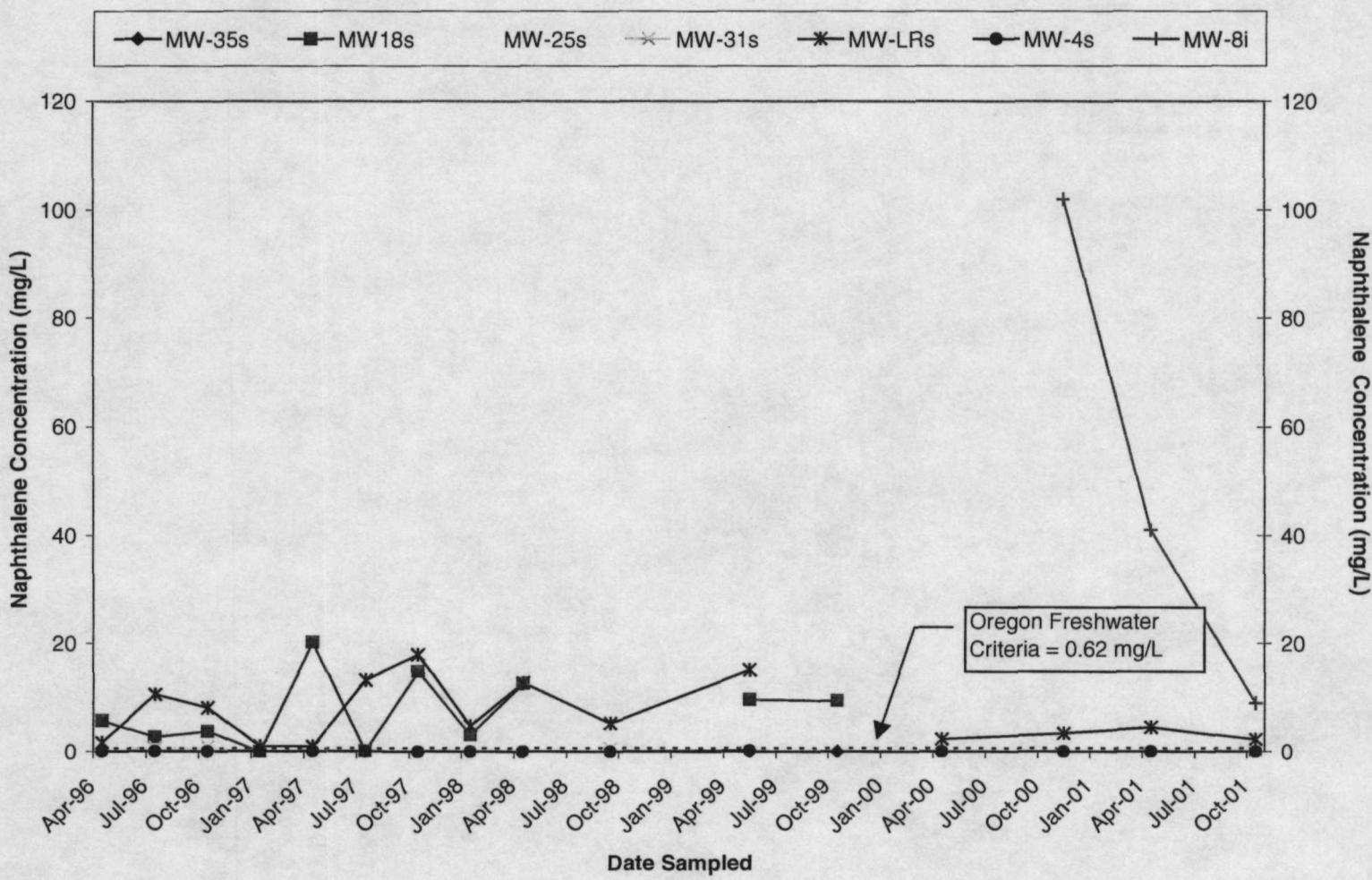
- ⊕ = LNAPL thicknesses measured during reporting period.
 - ⊖ = DNAPL thicknesses measured during reporting period.
 - = LNAPL and DNAPL thicknesses measured during reporting period.
 - ⊕ = No NAPL thicknesses measured during reporting period.
 - = Not measured

NAPL Well Classifications

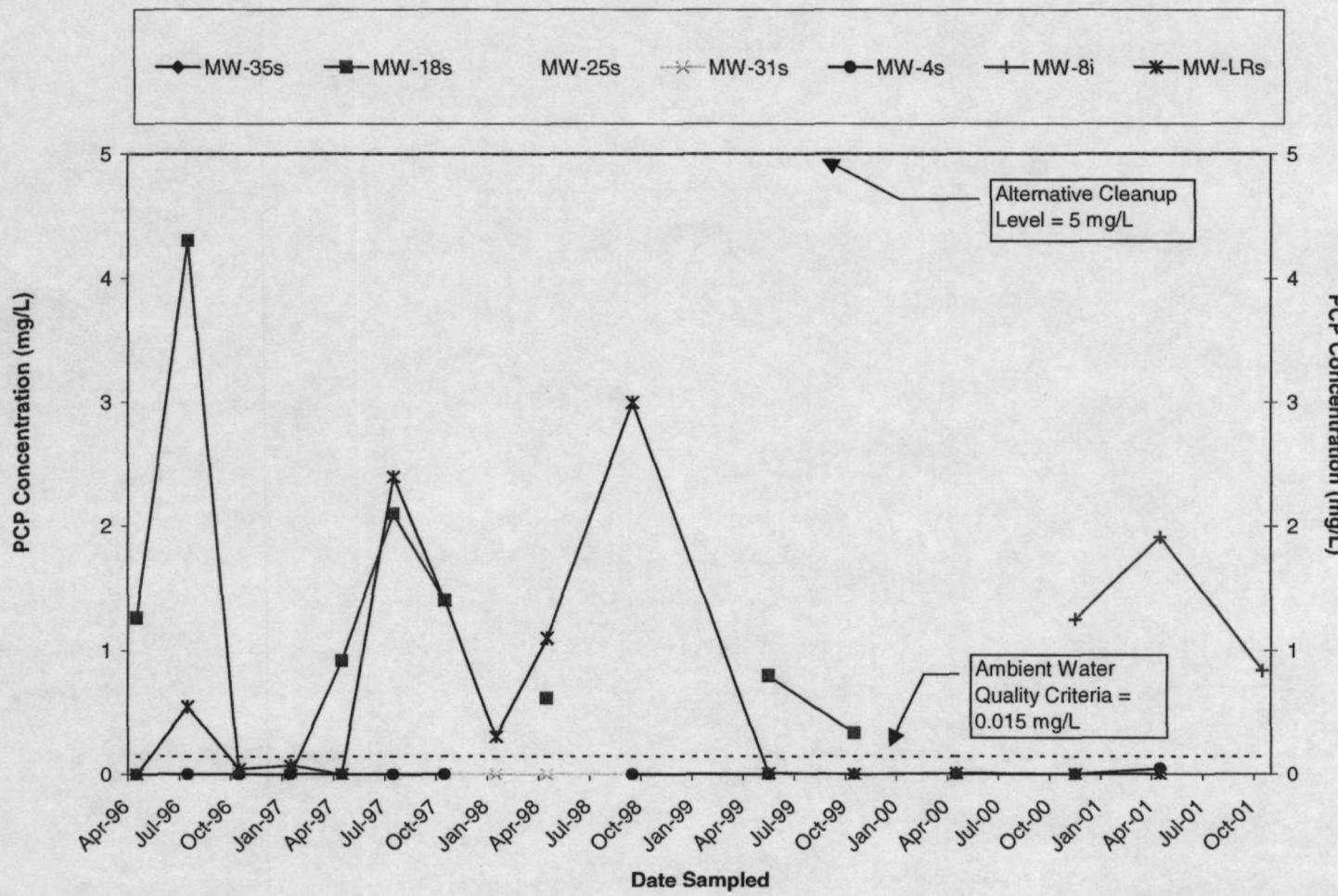
Third Quarter 1997



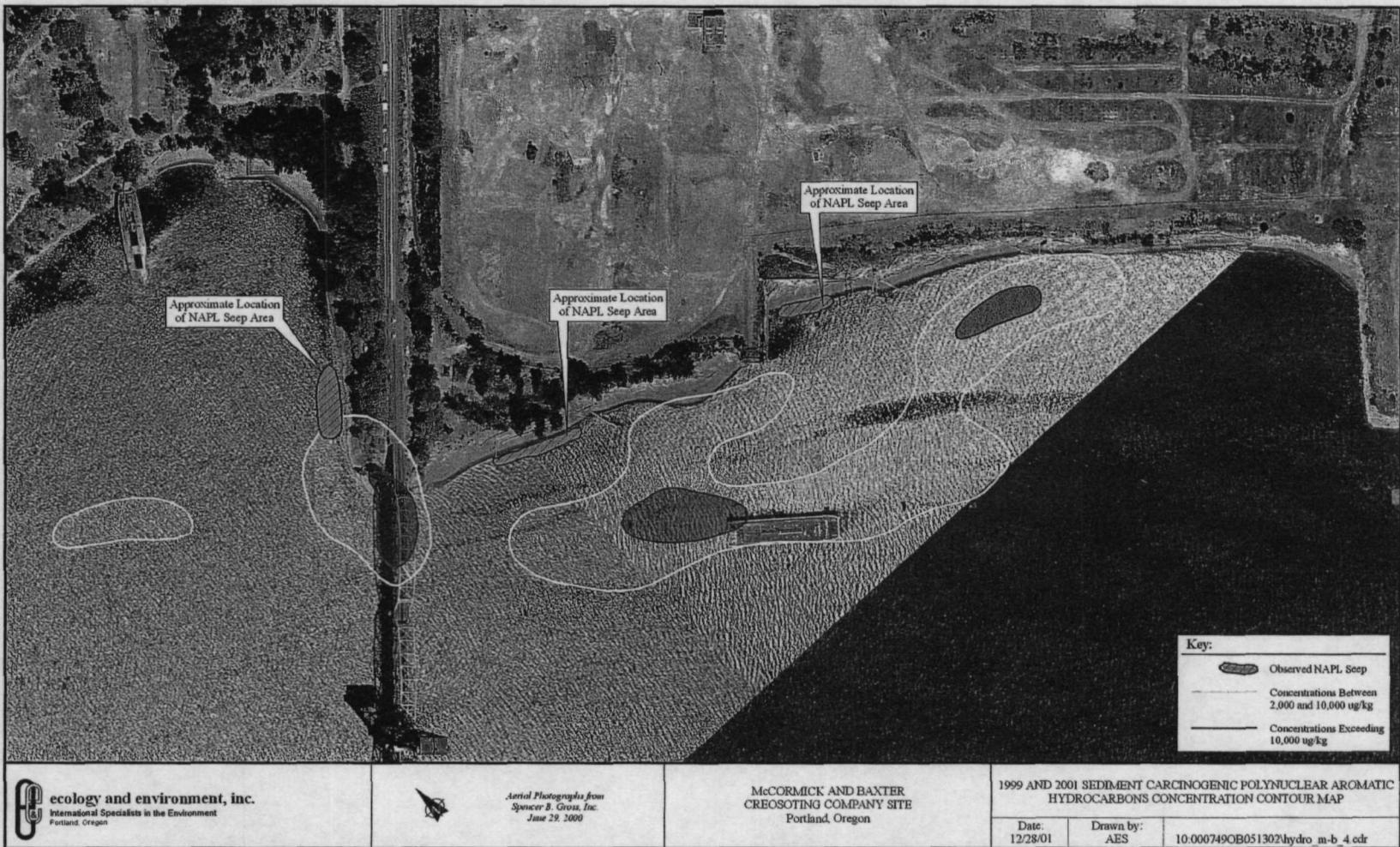
Naphthalene Concentrations in Monitoring Wells vs. Time



Pentachlorophenol Concentrations in Monitoring Wells vs. Time



1999 and 2001 Sediment Carcinogenic Polynuclear Aromatic Hydrocarbon Concentration Contour Map



ecology and environment, inc.
International Specialists in the Environment
Portland, Oregon

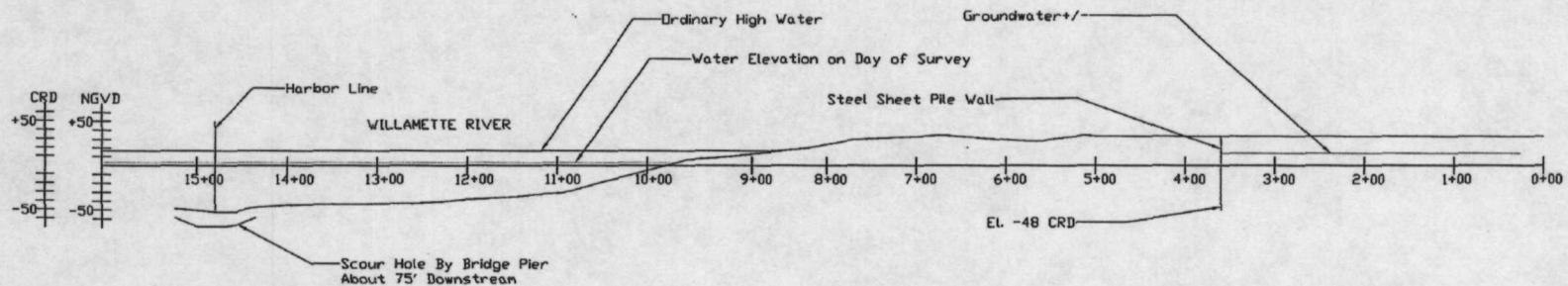


Aerial Photography from
Spencer B. Gross, Inc.
June 29, 2000

MCCORMICK AND BAXTER
CREOSOTING COMPANY SITE
Portland, Oregon

Backup Information

Hydrologic Profile



SECTION ALONG SEWER LINE SOUTH EASEMENT (EXTENDED)

Summary of Aquifer Parameters at McCormick & Baxter Superfund Site

Aquifer Zone	Hydraulic Gradient ^a (dimensionless)	Hydraulic Conductivity ^b (feet/day)	Estimated Aquifer Thickness (feet)
Shallow	0.0024-0.011 ^c	6-47 [26]	15-20
Intermediate	0.00033	12-30 [21]	12-70
Deep	0.0011 ^d	17 ^e	--

Source: (PTI 1992, 1995)

Note:

-- data not available

^a Does not include short-term reversals in gradient due to tidal or seasonal fluctuation of the river stage.

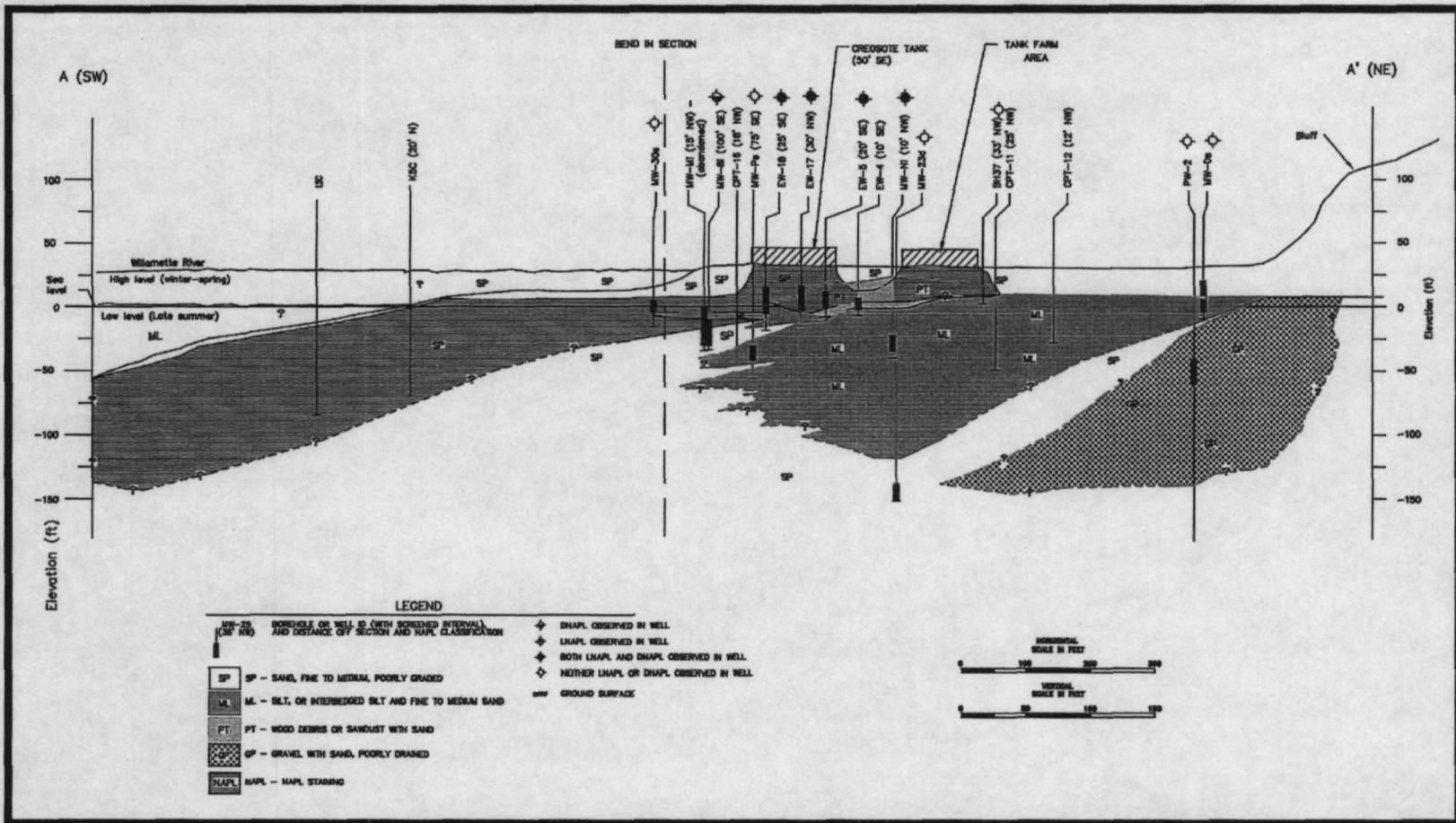
^b Average value in brackets.

^c Gradients vary seasonally and across the site. Steeper gradients are generally found near the Willamette River margin and in the late summer/early fall.

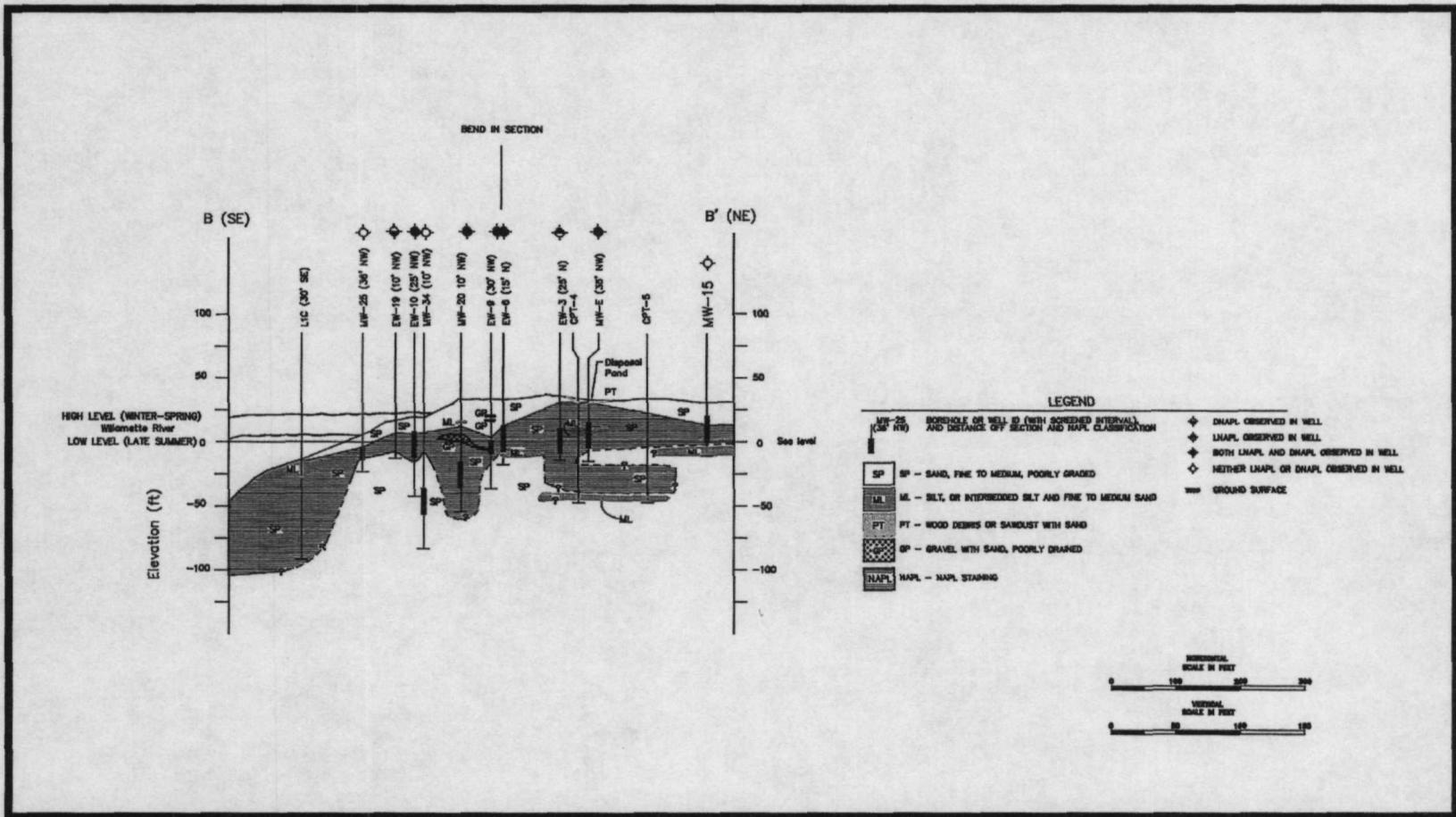
^d Based on data from October-November 1993.

^e Based on an assumed deep zone thickness of 100 feet.

Ecology and Environment, Inc.



Ecology and Environment, Inc.



NAPL Well Classifications Second Half 2001



NAPL Properties

Well Number	Installation Date	Total Depth Drilled (feet)	Temperature (°F)	Density	Kinematic Viscosity (cSt)
Tank Farm Area					
MW-1s	07/01/84	40.0	50.0	1.033	70.0
MW-Ps	08/84	89.0			
MW-7s	11/15/90	42.0	53.6	1.048	17.6
MW-8I	01/21/91	65.5	49.5	1.073	<17.5
EW-1s	10/01/87	NA	50.0	1.023	50.6
EW-4s	08/12/92	37.5	48.2	1.012	38.5
EW-5s	08/14/92	39.5			
EW-7s	08/28/92	39.5			
EW-8s	09/01/92	64.5			
Former Waste Disposal Area					
MW-Ds	09/28/83	32.0	49.0	1.025	23.1
MW-Es	07/10/84	48.0			
MW-Gs	07/01/84	39.5	51.0	1.010	<17.5
MW-18s	11/20/90	57.0			
MW-20I	01/03/91	88.0	53.6	1.012	<17.5
MW-21s	01/19/91	57.5	50.0	0.998	<17.5
EW-2s	10/01/87	NA	50.0	1.024	INS
EW-3s	07/30/92	50.0			
EW-6s	08/17/92	50.5	50.0	1.008	<17.5
EW-9s	09/04/92	69.5	53.6	1.029	30.8
EW-10s	09/23/92	61.5	53.6	0.998	<17.5
Other Areas					
MW-10s	02/12/91	41.7			
MW-19s	11/12/90	32.0	51.0	1.038	INS
MW-22i	07/10/91	63.3	53.6	1.024	<17.5
Note: Kinematic viscosity = the ratio of absolute viscosity to density; measured in centistokes NA = Information not available. INS = Insufficient or inadequate sample.					
^a Temperature of NAPL when density and viscosity measurements conducted in field. ^b Values greater than 1.000 represent DNAPL; values below 1.000 represent LNAPL.					

